



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Reissue application of :  
Kinam Park et al. :  
U.S. Serial No: 10/807,227 : Art Unit: 1711  
Filed: March 22, 2004 : Examiner: John M. Cooney  
For: HYDROGEL COMPOSITES AND :  
SUPERPOROUS HYDROGEL COMPOSITES :  
HAVING FAST SWELLING, HIGH : Confirmation No: 1689  
MECHANICAL STRENGTH, AND :  
SUPERABSORBENT PROPERTIES :

DECLARATIONS UNDER 37 CFR 1.131

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

We, Kinam Park, Jun Chen and Haesun Park hereby declare the following:

1. We are the co-inventors of claims 1-40 in the above-identified patent application.
2. We did conceive and reduce to practice the claimed invention prior to May 7, 1997. The application directed to this invention was filed on May 13, 1997.
3. In support of our Declarations we refer to the attached Statement of Dr. James H. Meadows, which establishes that the instant invention disclosure was sent by Federal Express to the predecessor law firm, Lowe,

Price, LeBlanc & Becker, on December 16, 1996, as is evidenced by a facsimile letter signed by Dr. Kinam Park, to which is applied a "Received" date stamp of December 16, 1996.

4. The Statement of Dr. Meadows also provides a copy of a letter from him addressed to Dr. Kinam Park dated May 2, 1997, which forwards a final draft of the application for review.
5. The aforementioned documents prove that the present invention was conceived and reduced to practice well before May 7, 1997.

We further declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

7/11/06  
Date

\_\_\_\_\_  
Date

7/11/06  
Date

Kinam Park  
Kinam Park

\_\_\_\_\_  
Jun Chen

Haesun Park  
Haesun Park



DOCKET NO: 368-011C

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\_\_\_\_\_  
Date

July 12, 2006  
Date

\_\_\_\_\_  
Kinam Park

  
\_\_\_\_\_  
Jun Chen

\_\_\_\_\_  
Date

\_\_\_\_\_  
Haesun Park

DOCKET NO: 368-011C



PATENT

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MECHANICAL STRENGTH, AND :  
SUPERABSORBENT PROPERTIES :

**STATEMENT OF JAMES H. MEADOWS**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, James H. Meadows, am the attorney representing applicants in the above-identified patent application. I hereby state the following:

1. The instant invention disclosure was sent by Federal Express to the predecessor law firm, Lowe, Price, LeBlanc & Becker, on December 16, 1996, as is evidenced by a facsimile letter signed by Dr. Kinam Park, to which is applied a "Received" date stamp of December 16, 1996.
2. A final draft of the application was sent by me to Dr. Kinam Park for review on May 2, 1997.

3. Copies of the aforementioned documents are forwarded herewith.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

6/27/06  
Date

J H Meadows  
James H. Meadows, Ph.D.

Attachments



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Kinam Park, Ph.D.  
Professor of Pharmaceutics

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E-mail: esp@omni.cc.purdue.edu

RECEIVED

December 16, 1996

Mr. Robert L. Price  
Law Offices  
Lowe, Price, Leblanc & Becker  
Suite 300  
99 Canal Center Plaza  
Alexandria, VA 22314

DEC 16 1996

RECEIVED VIA FACSIMILE

Tel: 703-684-1111  
Fax: 703-684-1124 (or 1145)

Re: Disclosure on "Synthesis of superporous hydrogel composites with fast swelling, high mechanical strength, and superabsorbent properties" by Kinam Park, Jun Chen, and Haesun Park

Dear Mr. Price:

I sent the above mentioned disclosure to you by Federal Express. Please fax me a note upon your receipt.

Thank you very much for your help and look forward to working with you.

With best regards,

Kinam Park

**LOWE PRICE LEBLANC & BECKER**

SUITE 300  
99 CANAL CENTER PLAZA  
ALEXANDRIA, VIRGINIA 22314

TELEPHONE: 703-684-1111  
FACSIMILE: 703-684-1124

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TRADEMARK  
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KEITH J. TOWNSEND

May 2, 1997

**VIA COURIER**

214 5673 923

Dr. Kinam Park  
Professor of Pharmaceutics  
School of Pharmacy  
PURDUE UNIVERSITY  
West Lafayette, IN 47907-1336  
USA

Re: New U. S. Patent Application  
For: HYDROGEL COMPOSITES AND SUPERPOROUS HYDROGEL  
COMPOSITES HAVING FAST SWELLING, HIGH MECHANICAL  
STRENGTH, AND SUPERABSORBANT PROPERTIES  
Inventor: Kinam Park et al.  
Our Reference: 3178-001

Dear Dr. Park:

Please find enclosed a draft of the above-mentioned patent application which incorporates the changes forwarded with your April 21, 1997 letter. As you will note, this draft reorganizes and revises the claims significantly from the previous draft which you considered. Consistent with our discussions on May 1, 1997, you will note that the claims now are directed to hydrogel composites and superporous hydrogel composites, as well as methods of making these materials.

Please review the draft at your earliest convenience and provide me with your comments. If you should have any further questions, please do not hesitate to contact me.

Very truly yours, .

LOWE PRICE LEBLANC & BECKER

*JH Meadows*  
James H. Meadows, Ph.D.

Enclosure



Quick links

# WATER STRUCTURE AND BEHAVIOR

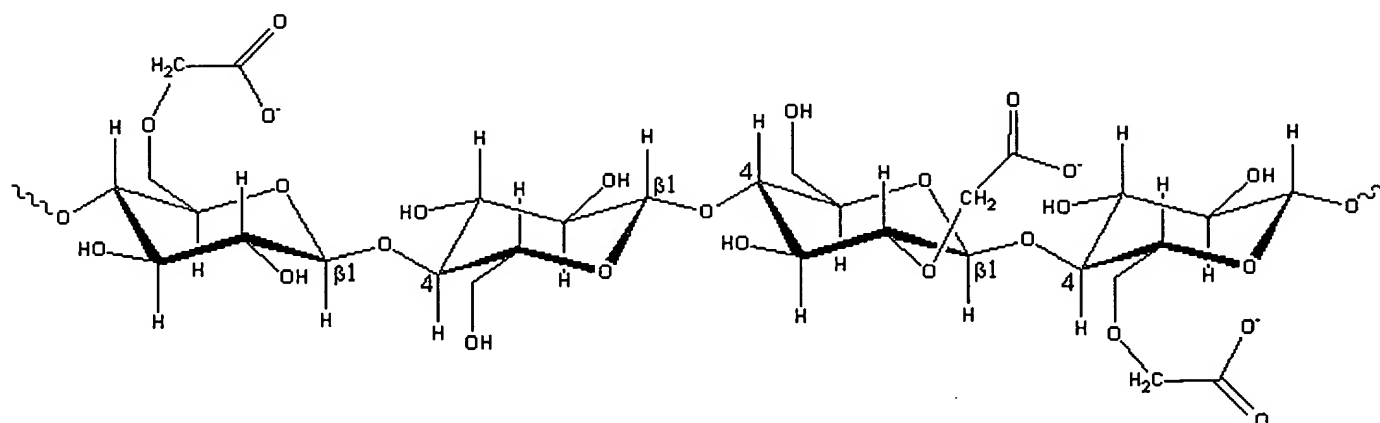
Search

## Carboxymethylcellulose (CMC)

### Source

Carboxymethylcellulose (CMC; E466) is a derivative of cellulose formed by its reaction with alkali and chloroacetic acid.

### Structural unit



The CMC structure is based on the  $\beta$ -(1 $\rightarrow$ 4)-D-glucopyranose polymer of cellulose. Different preparations may have different degrees of substitution, but it is generally in the range 0.6 - 0.95 derivatives per monomer unit.

### Molecular structure

CMC molecules are somewhat shorter, on average, than native cellulose with uneven derivatization g areas of high and low substitution. This substitution is mostly 2-O- and 6-O-linked, followed in order importance by 2,6-di-O- then 3-O-, 3,6-di-O-, 2,3-di-O- lastly 2,3,6-tri-O-.linked. It appears that the substitution process is a slightly cooperative (within residues) rather than random process giving slight higher than expected unsubstituted and trisubstituted areas. CMC molecules are most extended (rod-like) at low concentrations but at higher concentrations the molecules overlap and coil up and then, at high concentrations, entangle to become a thermoreversible gel. Increasing ionic strength and reducing pH both decrease the viscosity as they cause the polymer to become more coiled.

## Functionality

CMC dissolves rapidly in cold water and mainly used for controlling viscosity without gelling (CMC, at typical concentrations, does not gel even in the presence of calcium ions). As its viscosity drops during heating, it may be used to improve the volume yield during baking by encouraging gas bubble formation. Its control of viscosity allows use as thickener, phase and emulsion stabilizer (*e.g.* with milk casein), and suspending agent. CMC can be also used for its water-holding capacity as this is high even at low viscosity; particularly when used as the  $\text{Ca}^{2+}$  salt. Thus, it is used for retarding staling and reducing fat uptake into fried foods.

The average chain length and degree of substitution are of great importance; the more-hydrophobic lower substituted CMCs are thixotropic but more-extended higher substituted CMCs are pseudoplastic. At low pH, CMC may form cross-links through lactonization between carboxylic acid and free hydroxyl groups.

The solution properties of a range of commercial CMC's have been investigated [879].

Interactive structures are available (COW [Plug-in, ActiveX], 20 KB; Chime, 5 KB).

Please submit any comments and suggestions you may have.

[Site Index](#) | [Hydrocolloids](#) | [Polysaccharide hydration](#) | [Hydrogen bonding](#)



This page was last updated by Martin Chaplin  
on 19 April, 2006